Amendments to the Claims:

1. (Previously Presented) A magnetic resonance imaging method comprising:

dividing k space into a central region disposed at k space center and one or more annular surrounding regions having increasing distances from k space center, the one or more annular surrounding regions including an outermost surrounding region having a largest distance from k space center;

acquiring k space samples in the central region;

subsequent to the acquiring of k space samples in the central region, acquiring k space samples in the one or more annular surrounding regions, the k space samples in the outermost surrounding region being acquired last, the acquiring of k space samples in at least the outermost surrounding region using a row by row data acquisition ordering in which each row of k space samples acquired in the outermost surrounding region, together with selected already acquired k space data from the regions other than the outermost surrounding region, forms a completed data set for reconstructing an image plane; and

reconstructing each completed data set into a reconstructed image plane without waiting for all k space samples in the outermost surrounding region to be acquired such that the reconstructing occurs at least partially concurrently with the acquiring.

2. (Original) The method as set forth in claim 1, further comprising:

displaying each reconstructed image plane once it is available without waiting for the reconstructing of other image planes.

3. (Previously Presented) The method as set forth in claim 1, further comprising:

synchronizing the acquiring of k space samples in the central region with a trigger signal, the trigger signal being one of: (i) a selected duration after administering a magnetic contrast agent bolus, (ii) detecting a change in a magnetic

resonance signal intensity due to wash in of a magnetic contrast agent bolus, (iii) detecting a gating signal, and (iv) detecting a selected physiological event.

4. (Previously Presented) The method as set forth in claim 1, further comprising:

selecting a plurality of magnetic resonance imaging parameters for the acquiring of k space samples in the central region and in the one or more annular surrounding regions, the plurality of magnetic resonance imaging parameters including at least a data acquisition rate; and

determining the central region using (i) the selected plurality of magnetic resonance imaging parameters and (ii) a time interval for the acquiring of k space samples in the central region.

5. (Previously Presented) The method as set forth in claim 1, wherein the central region has a round or oval perimeter, and the outermost surrounding region has a round or oval inner perimeter and a square or rectangular outer perimeter.

6. (Previously Presented) The method as set forth in claim 1, wherein the acquiring of k space samples in the central region uses an acquisition ordering other than a row by row acquisition ordering.

7. (Previously Presented) The method as set forth in claim 6, wherein the acquiring of k space samples in the central region uses a random or pseudorandom ordering.

8. (Previously Presented) The method as set forth in claim 7, further comprising:

synchronizing the acquiring of k space samples in the central region with the administering of a magnetic contrast agent bolus.

9. (Original) The method as set forth in claim 6, further comprising:

sorting the k space samples of the central region into a row by row ordering.

10. (Previously Presented) The method as set forth in claim 1, wherein the one or more annular surrounding regions include at least two surrounding regions, and the acquiring of k space samples in the one or more annular surrounding regions other than the outermost surrounding region uses a random or pseudorandom ordering.

11. (Previously Presented) The method as set forth in claim 1, wherein the one or more annular surrounding regions include at least two surrounding regions, and the acquiring of k space samples in every annular surrounding region including the outermost surrounding region uses a row by row acquisition ordering.

12. (Previously Presented) The method as set forth in claim 1, wherein each k space sample is a readout line of k space.

13. (Original) The method as set forth in claim 1, wherein the acquiring of k space samples in at least the outermost surrounding region using a row by row acquisition ordering includes:

acquiring the k space samples using a serpentine row by row acquisition ordering.

14. (Original) The method as set forth in claim 1, wherein the acquiring of k space samples in at least the outermost surrounding region using a row by row acquisition ordering includes:

applying secondary coordinate magnetic field gradients to traverse each row of k space samples; and

switching to each new row of k space samples by applying a primary coordinate magnetic field gradient, the primary coordinate being generally transverse to the secondary coordinate.

15. (Original) The method as set forth in claim 1, wherein the acquiring of k space samples in at least the outermost surrounding region using a row by row acquisition ordering includes:

(i) acquiring a first row of k space samples by traversing secondary coordinate positions in a positive direction at a first primary coordinate position;

(ii) applying a primary coordinate magnetic field gradient to move to a second primary coordinate position;

(iii) acquiring the second row of k space samples by traversing secondary coordinate positions in a negative direction at the second primary coordinate position; and

(iv) repeating (i), (ii), and (iii) to acquire a plurality of rows of k space samples indexed by the primary coordinate.

16. (Previously Presented) The method as set forth in claim 15, wherein the primary coordinate is a slice coordinate, the secondary coordinate is a phase encode coordinate orthogonal to the slice coordinate, and each k space sample is a readout line along a third coordinate orthogonal to both the slice and phase encode coordinates.

17. (Original) The method as set forth in claim 1, wherein the acquiring of k space samples in at least the outermost surrounding region using a row by row acquisition ordering includes:

(i) acquiring a first contiguous portion k space samples along a row within the outermost annular surrounding region;

(ii) skipping at least samples along the row contained in the central region;

(iii) acquiring a second contiguous portion k space samples along the row within the outermost annular surrounding region, the second contiguous portion k space samples along the row being separated from the first contiguous portion k space samples along the row by at least the central region; and

repeating (i), (ii), and (iii) for each row of the row by row acquisition.

18-25. (Canceled)

26. (Previously Presented) A magnetic resonance imaging apparatus including one or more processors programmed to perform the method of claim 1.

27. (Previously Presented) A computer medium carrying a computer program for controlling one or more processors to perform the method of claim 1.

28. (Previously Presented) A magnetic resonance imaging apparatus including means for performing the steps of claim 1.

29. (New) A magnetic resonance imaging method comprising:

dividing k-space into a central region including k-space center and one or more annular surrounding regions having increasing distances from k-space center, the one or more annular surrounding regions including an outermost surrounding region having a largest distance from k-space center;

acquiring k-space samples in the central region;

subsequent to the acquiring of k-space samples in the central region, acquiring k-space samples in the one or more annular surrounding regions, the k-space samples in the outermost surrounding region being acquired last using a plane-by-plane acquisition ordering in which all k-space samples in the outermost surrounding region belonging to a current k-space plane are acquired to complete the current k-space plane before samples in the outermost surrounding region belonging to other k-space planes are acquired; and

reconstructing each completed current k-space plane into a reconstructed image plane without waiting for other k-space planes to be completed.

30. (New) The method as set forth in claim 29, wherein the k-space samples are readout lines of k space.